

(19)



Europäisches Patentamt

European Patent Office

Office européen des brevets



(11)

**EP 1 254 956 A3**

(12)

**EUROPEAN PATENT APPLICATION**

(88) Date of publication A3:  
13.11.2002 Bulletin 2002/46

(51) Int Cl.7: **C12N 15/12**, C07K 14/51,  
A61K 38/17

(43) Date of publication A2:  
06.11.2002 Bulletin 2002/45

(21) Application number: **02014841.7**

(22) Date of filing: **30.06.1987**

(84) Designated Contracting States:  
**AT BE CH DE FR GB IT LI LU NL SE**

(71) Applicant: **Genetics Institute, LLC**  
**Cambridge, MA 02140 (US)**

(30) Priority: **01.07.1986 US 880776**  
**17.12.1986 US 943332**  
**20.03.1987 US 28285**  
**26.03.1987 US 31346**

(72) Inventors:  
• **Wang, Elizabeth A.**  
**Carlisle, MA 01741 (US)**  
• **Wozney, John M.**  
**Hudson, MA 01749 (US)**  
• **Rosen, Vicki A.**  
**Boston, MA 02116 (US)**

(62) Document number(s) of the earlier application(s) in  
accordance with Art. 76 EPC:  
**95111771.2 / 0 688 869**  
**87905023.5 / 0 313 578**

(74) Representative: **VOSSIUS & PARTNER**  
**Siebertstrasse 4**  
**81675 München (DE)**

(54) **Novel osteoinductive compositions**

(57) Human and bovine bone inductive factor products and processes are provided. The factors may be produced by recombinant techniques and are useful in the research and treatment of bone and periodontal defects.

**EP 1 254 956 A3**



European Patent  
Office

# EUROPEAN SEARCH REPORT

Application Number  
EP 02 01 4841

DOCUMENTS CONSIDERED TO BE RELEVANT			
Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (Int.Cl.7)
X	US 4 455 256 A (URIST MARSHALL R). 19 June 1984 (1984-06-19) * the whole document *	14, 16-19	C12N15/12 C07K14/51 A61K38/17
X	URIST M R ET AL: "BONE CELL DIFFERENTIATION AND GROWTH FACTORS" SCIENCE, AMERICAN ASSOCIATION FOR THE ADVANCEMENT OF SCIENCE, US, vol. 4598, no. 220, 1 May 1983 (1983-05-01), pages 680-686, XP008003037 ISSN: 0036-8075 * the whole document *	14, 16-19	
X	URIST M ET AL: "THE BIOLOGICALLY-ACTIVE N-TERMINAL REGION OF THE BONE MORPHOGENETIC PROTEIN (BMP) MOLECULE ISOLATED BY PEP SIN LIMITED PROTEOLYSIS" FEDERATION PROCEEDINGS, BETHESDA, MD, US, vol. 3, no. 44, 1985, page 746 XP008003036 ISSN: 0014-9446 * the whole document *	14, 16-19	
X	URIST M R ET AL: "Purification of bovine bone morphogenetic protein by hydroxyapatite chromatography" PROCEEDINGS OF THE NATIONAL ACADEMY OF SCIENCES OF USA, NATIONAL ACADEMY OF SCIENCE. WASHINGTON, US, vol. 81, no. 2, January 1984 (1984-01), pages 371-375, XP002198250 ISSN: 0027-8424 * the whole document *	14, 16-19	C12N C07K A61K
The present search report has been drawn up for all claims			
Place of search <b>THE HAGUE</b>		Date of completion of the search <b>16 September 2002</b>	Examiner <b>Maddox, A</b>
<p><b>CATEGORY OF CITED DOCUMENTS</b></p> <p>X: particularly relevant if taken alone Y: particularly relevant if combined with another document of the same category A: technological background O: non-written disclosure P: intermediate document</p> <p>T: theory or principle underlying the invention E: earlier patent document, but published on, or after the filing date D: document cited in the application L: document cited for other reasons &amp;: member of the same patent family, corresponding document</p>			

EPO FORM 1503 03.82 (P04C01)



European Patent  
Office

Application Number

EP 02 01 4841

### CLAIMS INCURRING FEES

The present European patent application comprised at the time of filing more than ten claims.

- ☐ Only part of the claims have been paid within the prescribed time limit. The present European search report has been drawn up for the first ten claims and for those claims for which claims fees have been paid, namely claim(s):
- ☐ No claims fees have been paid within the prescribed time limit. The present European search report has been drawn up for the first ten claims.

### LACK OF UNITY OF INVENTION

The Search Division considers that the present European patent application does not comply with the requirements of unity of invention and relates to several inventions or groups of inventions, namely:

see sheet B

- ☐ All further search fees have been paid within the fixed time limit. The present European search report has been drawn up for all claims.
- ☒ As all searchable claims could be searched without effort justifying an additional fee, the Search Division did not invite payment of any additional fee.
- ☐ Only part of the further search fees have been paid within the fixed time limit. The present European search report has been drawn up for those parts of the European patent application which relate to the inventions in respect of which search fees have been paid, namely claims:
- ☐ None of the further search fees have been paid within the fixed time limit. The present European search report has been drawn up for those parts of the European patent application which relate to the invention first mentioned in the claims, namely claims:



European Patent  
Office

## EUROPEAN SEARCH REPORT

Application Number  
EP 02 01 4841

DOCUMENTS CONSIDERED TO BE RELEVANT			
Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (Int.Cl.7)
X	URIST M R ET AL: "BETA-TRICALCIUM PHOSPHATE DELIVERY SYSTEM FOR BONE MORPHOGENETIC PROTEIN" CLINICAL ORTHOPAEDICS AND RELATED RESEARCH, PHILADELPHIA, PA, US, vol. 187, July 1984 (1984-07), pages 277-280, XP008003034 * the whole document *	14,16-19	<div>TECHNICAL FIELDS SEARCHED (Int.Cl.7)</div>
P,X	EP 0 212 474 A (UNIV CALIFORNIA) 4 March 1987 (1987-03-04) * the whole document *	1-19	
P,X	US 4 619 989 A (URIST MARSHALL R) 28 October 1986 (1986-10-28) * the whole document *	1-19	
A	URIST M R ET AL: "HUMAN BONE MORPHOGENETIC PROTEIN (HBMP) (41630)" PROCEEDINGS OF THE SOCIETY FOR EXPERIMENTAL BIOLOGY & MEDICINE, WILLIAMS AND WILKINS, XX, vol. 2, no. 173, June 1983 (1983-06), pages 194-199, XP008003032 ISSN: 0037-9727 * the whole document *	1-19	
A	SAMPATH T K ET AL: "HOMOLOGY OF BONE INDUCTIVE PROTEINS FROM HUMAN MONKEY BOVINE AND RAT EXTRACELLULAR MATRIX" PROCEEDINGS OF THE NATIONAL ACADEMY OF SCIENCES OF THE UNITED STATES, vol. 80, no. 21, 1983, pages 6591-6595, XP002213538 1983 ISSN: 0027-8424 * the whole document *	1-19	
The present search report has been drawn up for all claims			
Place of search <b>THE HAGUE</b>		Date of completion of the search <b>16 September 2002</b>	Examiner <b>Maddox, A</b>
<div>CATEGORY OF CITED DOCUMENTS</div> <div> X: particularly relevant if taken alone  Y: particularly relevant if combined with another document of the same category  A: technological background  O: non-written disclosure  P: intermediate document  T: theory or principle underlying the invention  E: earlier patent document, but published on, or after the filing date  D: document cited in the application  L: document cited for other reasons  &amp; : member of the same patent family, corresponding document </div>			

EPO FORM 1503 03 82 (P04C01)



European Patent  
Office

**LACK OF UNITY OF INVENTION  
SHEET B**

Application Number

EP 02 01 4841

The Search Division considers that the present European patent application does not comply with the requirements of unity of invention and relates to several inventions or groups of inventions, namely:

1. Claims: 1-5 all completely and 11-19 all partially

Gene and protein encoding human BMP-1 and uses thereof

2. Claims: 6-10 all completely and 11-19 all partially

Gene and protein encoding bovine BMP-1 and uses thereof



European Patent  
Office

# EUROPEAN SEARCH REPORT

Application Number  
EP 02 01 4841

DOCUMENTS CONSIDERED TO BE RELEVANT			
Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (Int.Cl.7)
A	US 4 563 350 A (BENTZ HANNE ET AL) 7 January 1986 (1986-01-07) * the whole document *	1-19	
A	EP 0 148 155 A (DOW CHEMICAL CO) 10 July 1985 (1985-07-10) * the whole document *	1-19	
A	EP 0 121 976 A (COLLAGEN CORP) 17 October 1984 (1984-10-17) * the whole document *	1-19	
A	EP 0 128 041 A (BAYLINK DAVID JESTON) 12 December 1984 (1984-12-12) * the whole document *	1-19	
A	WO 85 04173 A (SYFTESTAD GLENN T ;CAPLAN ARNOLD I (US)) 26 September 1985 (1985-09-26) * the whole document *	1-19	
			TECHNICAL FIELDS SEARCHED (Int.Cl.7)
The present search report has been drawn up for all claims			
Place of search <b>THE HAGUE</b>		Date of completion of the search <b>16 September 2002</b>	Examiner <b>Maddox, A</b>
<p><b>CATEGORY OF CITED DOCUMENTS</b></p> <p>X: particularly relevant if taken alone  Y: particularly relevant if combined with another document of the same category  A: technological background  O: non-written disclosure  P: intermediate document</p> <p>T: theory or principle underlying the invention  E: earlier patent document, but published on, or after the filing date  D: document cited in the application  L: document cited for other reasons</p> <p>&amp; : member of the same patent family, corresponding document</p>			

EPO FORM 1503 03.02 (P04C01)

# ANNEX TO THE EUROPEAN SEARCH REPORT ON EUROPEAN PATENT APPLICATION NO.

EP 02 01 4841

This annex lists the patent family members relating to the patent documents cited in the above-mentioned European search report. The members are as contained in the European Patent Office EDP file on  
The European Patent Office is in no way liable for these particulars which are merely given for the purpose of information.

16-09-2002

Patent document cited in search report		Publication date	Patent family member(s)	Publication date
US 4455256	A	19-06-1984	US 4789732 A	06-12-1988
			US 4619989 A	28-10-1986
			US 4761471 A	02-08-1988
EP 0212474	A	04-03-1987	US 4795804 A	03-01-1989
			DK 374686 A	01-04-1987
			EP 0212474 A2	04-03-1987
			FI 863189 A	08-02-1987
			JP 62111933 A	22-05-1987
			NO 863185 A	09-02-1987
US 4619989	A	28-10-1986	US 4455256 A	19-06-1984
			US 4789732 A	06-12-1988
			US 4795804 A	03-01-1989
			US 4761471 A	02-08-1988
US 4563350	A	07-01-1986	AT 54830 T	15-08-1990
			AU 585268 B2	15-06-1989
			AU 4900585 A	01-05-1986
			CA 1266613 A1	13-03-1990
			DE 3578874 D1	30-08-1990
			EP 0182483 A1	28-05-1986
			JP 1855544 C	07-07-1994
			JP 5055149 B	16-08-1993
			JP 62016421 A	24-01-1987
			US 4888366 A	19-12-1989
			US 5001169 A	19-03-1991
EP 0148155	A	10-07-1985	AT 42309 T	15-05-1989
			AU 580975 B2	09-02-1989
			AU 3722184 A	11-07-1985
			CA 1241641 A1	06-09-1988
			DE 3569542 D1	24-05-1989
			DK 2285 A ,B,	05-07-1985
			EP 0148155 A2	10-07-1985
			GR 850006 A1	03-05-1985
			IE 57966 B1	02-06-1993
			JP 60226814 A	12-11-1985
			NZ 210699 A	28-06-1989
			US 4804744 A	14-02-1989
			ZA 8500047 A	24-09-1986
EP 0121976	A	17-10-1984	US 4434094 A	28-02-1984
			CA 1223199 A1	23-06-1987
			EP 0121976 A2	17-10-1984
			JP 1470319 C	14-12-1988

EPO FORM P0419

For more details about this annex : see Official Journal of the European Patent Office, No. 12/82

**ANNEX TO THE EUROPEAN SEARCH REPORT  
ON EUROPEAN PATENT APPLICATION NO.**

EP 02 01 4841

This annex lists the patent family members relating to the patent documents cited in the above-mentioned European search report.  
The members are as contained in the European Patent Office EDP file on  
The European Patent Office is in no way liable for these particulars which are merely given for the purpose of information.

16-09-2002

Patent document cited in search report		Publication date	Patent family member(s)	Publication date
EP 0121976	A		JP 59190919 A	29-10-1984
			JP 63016364 B	08-04-1988
EP 0128041	A	12-12-1984	CA 1229789 A1	01-12-1987
			EP 0128041 A2	12-12-1984
			JP 60069020 A	19-04-1985
			US 5807822 A	15-09-1998
WO 8504173	A	26-09-1985	US 4608199 A	26-08-1986
			AU 4113385 A	11-10-1985
			EP 0174993 A1	26-03-1986
			IT 1182721 B	05-10-1987
			WO 8504173 A1	26-09-1985

EPO FORM P0459

For more details about this annex : see Official Journal of the European Patent Office, No. 12/82